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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Hiroaki Matsuyama

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EXAMINER

NGUYEN, HOAN C

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 02/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/823,023	Applicant(s) MATSUYAMA, HIROAKI	
	Examiner HOAN C. NGUYEN	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-7, 10-16, 21, 22 and 24-42 is/are pending in the application.
 4a) Of the above claim(s) 5-7, 10-14, 16, 24-33, 40 and 41 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4, 15, 21 and 22 is/are allowed.
- 6) ☒ Claim(s) 34-39 and 42 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claims 1-5, 8-9, 17-20, 23 are cancelled. Claims 5-7, 10-14, 16, 24-33 and 40-41 are withdrawn due to nonelected species. Claims 4, 15, 21-22, 34-39 and 42 are elected.

Claims 4, 15 contain the allowed subject matter of claim 1 in the parent case; and claim 21 contains the allowed subject matter of claim 18 in the parent case. Therefore, these claims are allowed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claim 42 is rejected under 35 U.S.C. 102(b) as being anticipated by Yamada et al. (US6344883B2).

Yamada et al. teach (Fig. 32) a multi-domain alignment active-matrix liquid crystal display device comprising:

- first and second transparent plates 521-522 arranged to oppose each other;
- a liquid crystal being sandwiched between the first and second plates (col. 3 lines 31-33), and
- pixel electrodes 520 disposed on one of said plates and counterelectrodes 519 disposed on the other of said plates and adapted to apply voltage to the liquid crystal across the pixel electrodes and the counterelectrodes;

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wherein

- an orientation layer 510 is provided at least on each pixel electrode disposed on one of said plates,
- at least one columnar spacer is provided on said orientation layer between the two opposing plates for regulating a panel gap between said plates, said at least one columnar spacer disposed approximately at a center of a pixel.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 34-39 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horie et al. (US6061117A) in view of **Yoshida et al. (US6512564B1)**.

Regarding to claims 34-35 and 42, Horie et al. disclose (Figs. 5 and 10B) a multi-domain alignment active-matrix liquid crystal display device comprising:

- first and second transparent plates^{1/2} arranged to oppose each other;
- a liquid crystal being sandwiched between the first and second plates,
- pixel electrodes 3 disposed on one of said plates and counterelectrodes 6 disposed on the other of said plates and adapted to apply voltage to the liquid crystal across the pixel electrodes 3 and the counterelectrodes 6;

wherein

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- an orientation layer 16/17 (Fig. 5 shown) is provided at least on each pixel electrode disposed on one of said plates, and at least one columnar spacer (protrusion/convex portion 4, the height of 4 is less than the cell gap) having a side surface of that is slanted or inclined is provided between the two opposing plates for regulating a panel gap between said plates, said at least one columnar spacer disposed approximately at a center of a pixel (col. 4 line 28 to col. 5 line 17, col. 7 lines 29-48 and col. 15 lines 39-65).

Claim 36:

- said at least one columnar spacer has a diameter varying along its axis as Fig. 5 shown.

Claim 37:

- said at least one columnar spacer has a diameter decreasing or increasing toward one end thereof as Fig. 5 shown.

Claim 38:

- said side surface is adapted to pre-align molecules of the liquid crystal substantially parallel to the sidewall since the convex portion 4 is formed by a material having the vertical alignment property (col. 15 line 58-60).

Claim 39:

- said orientation layer is formed into a curved or slanted surface so as to orient molecules of the liquid crystal in a defined direction normal to the curved or slanted surface of said orientation layer since the concave portion 15 is formed by a material having the vertical alignment property (col. 15 line 58-60).

However, Horie et al. fail to disclose a multi-domain alignment active-matrix liquid crystal display device comprising at least one columnar spacer provided between the two opposing plates for regulating a panel gap between plates wherein the surface of the columnar spacer is adapted to pre-aligned liquid crystal surrounding each columnar spacer substantially parallel to the surface of the columnar spacer (claims 34 and 38).

Yoshida et al. teach (Figs. 67-68) a multi-domain alignment active-matrix liquid crystal display device comprising at least one spacer provided between the two opposing plates for regulating a panel gap between plates (col. 33 lines 65-67); wherein the surface of the spacer is adapted to pre-aligned liquid crystal surrounding each columnar spacer substantially parallel to the surface of the columnar spacer for arising dark display, thus enhancing contrast ratio (col. 34 lines 4-15).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a multi-domain alignment active-matrix liquid crystal display device as Horie et al. disclosed with at least one columnar spacer provided between the two opposing plates for regulating a panel gap between plates as taught by **Yoshida et al.** (col. 33 lines 65-67); wherein a liquid crystal contiguous to the surface of the columnar spacer aligned substantially parallel to the surface of the spacer for arising dark display, thus enhancing contrast ratio as taught by **Yoshida et al.** (col. 34 lines 4-15).

Allowable Subject Matter

Claims 4, 15 and 21-22 allowed.

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The following is a statement of reasons for the indication of allowable subject matter:

Claims 4, 15 and 21 are allowed since there is no prior art before August 28, 1998 (Foreign Priority) teaches an active-matrix liquid crystal display device comprising

- said orientation layer on the pixel electrode formed into a curved surface and oriented molecules of the liquid crystal aligned in a direction normal to the curved surface of said orientation layer,
- at least one columnar spacer having a diameter varying along its axis is provided between the two opposing plates for regulating a panel gap therebetween, said at least one columnar spacer disposed approximately at a center of a pixel.

Claim 22 is allowed since it depends on the allowed claim 21.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HOAN C. NGUYEN whose telephone number is (571) 272-2296. The examiner can normally be reached on MONDAY-THURSDAY:8:00AM-4:30PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim H. Robert can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HOAN C. NGUYEN
Examiner
Art Unit 2871

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ANDREW SCHECHTER
PRIMARY EXAMINER